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| Q1: What is the pH Scale? |  | Q6: As acids become more acidic, their pH values    increase or decrease? |
| Q2: The range of values of the pH scale is: |  | Q7: As bases become more  alkaline, their pH values  increase or decrease? |
| Q3: The range of values for acids on the pH scale is: |  | Q8: The pH scale is a  \_\_\_\_ scale meaning it is  base 10. |
| Q4: The range of values for bases on the pH scale is: |  | Q9: Which is more acidic: pH=1 or pH=3? |
| Q5: The pH value for a neutral substance is: |  | Q10: Which is more basic:  pH=8 or pH=11 |
| A6: decrease |  | A1: number line that assigns number values from 0 to 14 to acids and bases |
| A7: increase |  | A2: 0 to 14 |
| A8: logarithmic |  | A3: Below 7 |
| A9: pH=1, lower value is more acidic |  | A4: Above 7 |
| A10: pH=11, greater value is more basic |  | A5: 7 |
| Q11: How many times more acidic is pH=2 than pH=4? |  | Q17: Examples of basic substances are: |
| Q12: Acidic substances taste: |  | Q18: Two examples of indicators are: |
| Q13: Basic (or alkaline) substances taste: |  | Q19: Pure water has a pH of: |
| Q15: What is an indicator? |  | Q20: In acids, litmus paper turns from \_\_\_\_ to \_\_\_\_ in color. |
| Q16: Examples of acidic substances are: |  | Q21: In bases, litmus paper turns from \_\_\_\_ to \_\_\_\_ in color. |
| A17: cleaning products, drain cleaner, ammonia |  | A11: pH=2 is 100 times (or 102) more acidic than pH=4 |
| A18: cabbage juice,  litmus paper |  | A12: sour |
| A19: 7 |  | A13: bitter |
| A20: blue to red |  | A15: substances that change color when they come into contact with acids and bases |
| A21: red to blue |  | A16: stomach acid, lemon juice, vinegar, sour foods |
| Q22: The acid found in the stomach is: |  | Q27: The name of OH- is: |
| Q23: What does “dissociate” mean? |  | Q28: What is an Arrhenius acid? (What does it contribute to a solution?) |
| Q24: The chemical formulas of acids contain: |  | Q29: What is an Arrhenius base? (What does it contribute to a solution?) |
| Q25: The chemical formulas of bases contain: |  | Q30: What is a Bronsted-Lowry acid? |
| Q26: The formula for hydroxide is: |  | Q31: What is a Bronsted-Lowry base? |
| A27: hydroxide |  | A22: hydrochloric acid  or HCl |
| A28: adds hydrogen ions, H+, to aqueous solution |  | A23: to break apart |
| A29: adds hydroxide ions, OH-, to aqueous solution |  | A24: Hydrogen ions (H+) |
| A30: proton donor  (A proton is H+) |  | A25: Hydroxide ions  (OH-) |
| A31: proton acceptor  (A proton is H+) |  | A26: OH- |
| Q32: \_\_\_\_\_ acids and bases dissociate completely. |  | Q37: Is lithium hydroxide an acid or a base? |
| Q33: \_\_\_\_ acids and bases dissociate partially. |  | Q38: Is acetic acid (vinegar) a strong or weak acid? |
| Q34: Is H2SO4 an acid or base? |  | Q39: Is ammonia, NH3, a strong or weak base? |
| Q35: Is NaOH an acid or base? |  | Q40: Is hydrochloric acid (stomach acid, HCl) a strong or weak acid? |
| Q36: Strong or weak acid? |  | Q41: Strong or weak acid? |
| A37: Base |  | A32: Strong |
| A38: Weak |  | A33: Weak |
| A39: weak base |  | A34: Acid |
| A40: strong acid |  | A35: Base |
| A41: strong acid, dissociated completely |  | A36: Weak, dissociated partially |
| Q42: Which is a stronger acid: 1.0M H2SO4, H3PO4, or HCl? |  | Q47:  If [H+]= 1.0 x 10-5  pH = ? |
| Q43: Do acids have a higher concentration of H+ or OH- |  | Q48:  If [H+]= 1.0 x 10-11  pH = ? |
| Q44:  pH = -log[ ? ] |  | Q49:  If pH=2, pOH=? |
| Q45:  pOH = -log [ ? ] |  | Q50:  If [OH-]= 1.0 x 10-2,  [H+]=? |
| Q46: pH + pOH = |  | Q51:  If [OH-]= 1.0 x 10-2,  pOH=? |
| A47: 5 |  | A42: The H3PO4 would have a higher concentration of [H+] and a lower pH.  (It dissociates into H+, H+, H+, and PO43-) |
| A48: 11 |  | A43: Acids have a higher concentration of H+ |
| A49: 12 |  | A44: H+ |
| A50: If [OH-]= 1.0 x 10-2,  **[H+]=1.0 x 10-12** |  | A45: OH- |
| A51: 2 |  | A46: 14 |
| Q52:  If [OH-]= 1.0 x 10-2,  pH=? |  | Q57:  Which has a higher pH:  1.0M Ca(OH)2 or NaOH? |
| Q53:  [OH-][H+]= ? |  | Q58: Which is larger  in an acid; [H+] or [OH-]? |
| Q54:    If [H+]=1.0 x 10-8, [OH-]=? |  | Q59: As concentration of H+ increases, does pH increase or decrease? |
| Q55: If [OH-]=1.0 x 10-4,  pH=? |  | Q60: If [H+]=1.0 x 10-9,  pOH=? |
| Q56: If [H+]= 1.0 x 10-9,  pH = ? |  | Q61: What is [H+] of neutral solutions? |
| A57: Ca(OH)2 because it dissociates into Ca2+ and OH- and OH-. More OH- means higher pH |  | A52: 12 |
| A58: H+ |  | A53: 1.0 x 10-14 |
| A59: pH would decrease. More H+ means stronger acid and lower pH |  | A54: 1.0 x 10-6 |
| A60: 6 |  | A55: 10 |
| A61: pH=7 so  [H+]= 1.0 x 10-7 |  | A56: 9 |
| Q62: What is dilution? |  | Q67: To move from a pH=1 to pH=3, it is diluted by a factor of: |
| Q63: When an acid is diluted, its pH \_\_\_\_\_\_\_.  (increases or decreases?) |  | Q68: When diluting a solution from pH=12 to pH=9, it is diluted by a factor of: |
| Q64: When a base is diluted, its pH \_\_\_\_.  (increases or decreases?) |  | Q69: If the original volume of a solution is 1mL, what is the final volume when it is diluted by a factor of 100? |
| Q65: When acids or bases are diluted, their pH moves toward \_\_\_\_ on the pH scale. |  | Q70: How much water should be added to 10 mL of HCl to move from pH=2 to pH=3? |
| Q66: What is the pH of a solution when 1 mL of an acid with a pH of 1 is diluted to 1000 mL with water? |  | Q71: What is the pH of a solution when 10 mL of a base with a pH of 10 is diluted to 100 mL with water? |
| A67: 100x diluted  (1 to 3 on pH scale = 102 = 100)  -or-  (1x10-1 ÷1x10-3 = 100) |  | A62: adding more and more water to a solution |
| A68: 1000x more dilute  (12 to 9 on pH scale = 103 = 1000)  -or-  (1x10-12 ÷1x10-9 = 1000) |  | A63: increases (moves toward neutral pH of 7) |
| A69: (1 mL) x (100) =    100 mL |  | A64: decreases (moves toward neutral pH of 7) |
| A70: 90 mL  (\*pH 2 to 3 is dilute by factor of 10.  \*10 mL (orig) x 10 = 100 mL total  \*Had 10 mL (orig) so add 90 more) |  | A65: 7 |
| A71: pH = 9  (Diluting from 10 mL to 100 mL is a factor of 10. The pH will move one space on scale toward neutral 7. |  | A66: pH=4  (\*1 mL to 1000 mL is a dilution of 1000x.  \*1000 =103  \*103 means moving 3 spaces on pH scale) |
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